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Behaviour of Dust Control Agents Applied to Fly Ash Under Winter Conditions

C.B.H. Cragg

The comparative performance of several dust control agents was evaluated under simulated winter conditions in the laboratory. Saturated fly ash samples were conditioned to temperatures below or just above the freezing point, then treated with dust control agent. The samples were subjected to wind after periods of freeze-thaw temperature cycling. Performance data for five dust control agents is presented and compared.

INTRODUCTION

Recent changes in the operating methods used in the Nanticoke TGS ash lagoon result in the stacking of saturated fly ash during the winter season. Freeze drying of these ash stacks under dry winter conditions makes the lagoon area susceptible to dust excursions. Dust control under these conditions is difficult because equipment cannot travel on the wet ash to spread cover material and the saturated condition of the ash limits the ability of dust control agents to infiltrate the ash and form a well bonded surface crust. On sloped surfaces, the dust control agent may run off the target area before it has time to set and protect the ash surface. As cover material cannot be used, the ability of several dust control agents to perform under winter conditions was tested in a laboratory program. The testing described in this report was performed by request of Nanticoke TGS and Central Thermal Services, following a dust excursion in the winter of 1984-85.

SAMPLING PREPARATION

All tests were performed on bituminous coal fly ash. This material typically is uniformly graded and has about 85% of its weight consisting of particles smaller than 0.075 mm diameter. The fly ash was prepared to a

water content (dry basis) of 32 to 34%, dumped in a mass into pie plate containers and shaped by hand into conical specimens. These loose to compact specimens had a diameter of 230 mm and a height of about 80 mm. No drainage was allowed through the pie plates.

After forming, the specimens were conditioned in an environmental chamber at a temperature of either (a) + 4°C or (b) -20°C prior to treatment with dust control agents. Five dust control agents were tested: Calgon DCL-1817, Bondall, Dusticide, Hercobind DSC-3W and Resinex. Each agent was diluted 5:1 water:product, except Calgon which was 4:1, and sprayed on the fly ash specimens using a household plant sprayer. Three application rates were used for the diluted product: 0.09 gal/yd^2, 0.18 gal/yd^2 and 0.54 gal/yd^2. The dust control solutions were prepared with + 10°C water to simulate winter conditions. After preparation, the treated specimens were frozen overnight prior to environmental testing.

TEST PROCEDURE

After preparation, the specimens were subjected to the following testing regimen:

1. freeze overnight (-17°C)
2. remove from freezer to (+20°C +/-) room temperature then immediately apply 50 kph wind for 10-15 minutes and measure weight loss
3. allow specimen to thaw for approximately 4 hours
4. apply 50 kph wind for 10-15 minutes and measure weight loss
5. repeat steps 1. to 4. (maximum three cycles)

Weight loss was determined by weighing the specimens immediately before and immediately following wind testing. The condition of the surface crust, formed by the dust control agents was assessed after each test cycle by visual inspection. Moisture contents were taken from the test fly ash used to form the specimens and from each specimen at the end of all testing. Photographs were taken of the specimens at the end of the complete test sequence.

OBSERVATIONS

Weight loss measurements were not a reliable indicator of the crust formed by the dust control agents. In many cases where the sample lost weight, a decrease in water content was measured after the test. In other tests, the sample gained weight due to condensation forming on the specimen. These weight changes frequently occurred when no visible change took place in the dust control agent crust. Conversely, when the crust did break down significantly, as noted by visual inspection, the weight loss was frequently minor compared to samples that lost moisture but not crustal material.

Performance of the various dust control agents and application rates are detailed in Appendix A. A review of these results indicated that performance was generally not affected by increasing the application rate.

As summarized in Table I, only Resinex and Dusticide performed well under both the +4°C and -20°C application conditions. Hercobind deteriorated

gradually under the +4°C application condition but performed well on the -20°C sample. Calgon and Bondall crusts did not bond to the -20°C samples and peeled off immediately. Performance of these latter two products on +4°C samples was good.

Of the dust control agents used, the Resinex and Dusticide were, comparatively, the easiest to apply and to clean from the test equipment.

CONCLUSIONS

Based on good performance in the laboratory dust tests, Resinex and Dusticide are recommended for dust control at the Nanticoke ash lagoon in winter conditions.

Low application rates are suggested for initial use as increased dosage did not improve performance.

Effects of winter precipitation was not evaluated in these tests. Reapplication of these products may be required in the dry spells following periods of sleet, freezing rain, snow or hail.

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TABLE I

Performance Summary of Winter Tests on Dust Control Agents

Dust Control Agent Used to Make Crust	Performance of Crust Under Testing: Applied to Frozen Sample at -20°C	Performance of Crust Under Testing: Applied to Sample at +4°C
Calgon (DCL-1817)	deteriorated immediately	slight deterioration
Bondall	deteriorated immediately	slight deterioration
Dusticide	no visible deterioration	no visible deterioration
Hercobind	no visible deterioration	gradual deterioration
Resinex	no visible deterioration	no visible deterioration

APPENDIX A

DETAILED SUMMARIES OF DUST CONTROL TESTS

SPECIMEN NO 1A

TEST DATE June 10-17, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 4:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.75 in

INITIAL MOISTURE CONTENT 33 %

TOTAL WEIGHT 3025 g

FINAL MOISTURE CONTENT 20 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	no deterioration
	thawed	11	11	
2	frozen	3	14	no deterioration
	thawed	10	24	
3	frozen	2	26	slight deterioration
	thawed	13	39	

SPECIMEN NO 2A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.75 in

INITIAL MOISTURE CONTENT 33 %

TOTAL WEIGHT 3536 g

FINAL MOISTURE CONTENT 9 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	2	2	immediate peeling of crust - test discontinued
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 3A

TEST DATE June 10-17, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 4:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2851 g

FINAL MOISTURE CONTENT 21 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	8	8	no deterioration
2	frozen	1	9	
	thawed	11	20	no deterioration
3	frozen	1	21	
	thawed	12	33	slight deterioration

SPECIMEN NO 4A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.75 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3375 g

FINAL MOISTURE CONTENT 8 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	13	13	immediate peeling of crust - test discontinued
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 5A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.54 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 34 %

TOTAL WEIGHT 3444 g

FINAL MOISTURE CONTENT 11 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	—	—	Sample slumped during application of dust control agent. Dust control agent running off sample. Not tested.
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 6A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Calgon

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 34 %

TOTAL WEIGHT 3512 g

FINAL MOISTURE CONTENT 9 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	8	8	immediate peeling of crust - test discontinued
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 7A

TEST DATE June 10-17, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2818 g

FINAL MOISTURE CONTENT 21 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	6	6	no deterioration
2	frozen	3	9	
	thawed	15	24	no deterioration
3	frozen	2	26	
	thawed	11	37	slight deterioration

SPECIMEN NO 8A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2822 g

FINAL MOISTURE CONTENT 8 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	12	12	immediate peeling of crust - test discontinued
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 9A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.25 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2809g

FINAL MOISTURE CONTENT 22 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	1	1	
	thawed	5	6	
2	frozen	4	10	
	thawed	12	22	
3	frozen	2	24	
	thawed	10	34	no deterioration

SPECIMEN NO 10A

TEST DATE June 10, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.18 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 35 %

TOTAL WEIGHT 3217 g

FINAL MOISTURE CONTENT 9 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	10	10	immediate peeling of crust - test discontinued
	thawed	—	—	
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 11A

TEST DATE June 10-17, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 35 %

TOTAL WEIGHT 3107 g

FINAL MOISTURE CONTENT 28 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	13	13	no deterioration
2	frozen	5	18	
	thawed	10	28	no deterioration
3	frozen	1	29	
	thawed	23	52	slight deterioration

SPECIMEN NO 12A

TEST DATE June 10-17, 1985

DUST CONTROL PRODUCT Bondall

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 35%

TOTAL WEIGHT 3111 g

FINAL MOISTURE CONTENT 29 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	6	6	water bleeding out from under crust
2	frozen	3	9	
	thawed	12	21	no deterioration
3	frozen	1	22	
	thawed	19	41	slight deterioration

SPECIMEN NO 1B

TEST DATE June 28-July 4/85

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.09 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 31 %

TOTAL WEIGHT 3193 g

FINAL MOISTURE CONTENT 31 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	3	3	no deterioration
2	frozen	-	3	immediate peeling of crust - test discontinued.
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	

SPECIMEN NO 2B

TEST DATE June 28-July 8/85

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 31 %

TOTAL WEIGHT 3379 g

FINAL MOISTURE CONTENT 31 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	1	1	Condensation on crust. Sample gained weight.
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	no deterioration

SPECIMEN NO 3B

TEST DATE June 28-July 4, 1985

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.18 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3476 g

FINAL MOISTURE CONTENT 31 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	—	—	Sample gained weight
	thawed	—	—	
2	frozen	—	—	no deterioration
	thawed	—	—	
3	frozen	—	—	40% of crust lost
	thawed	—	—	

SPECIMEN NO 4B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.0 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2956 g

FINAL MOISTURE CONTENT 33 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	—	—	Condensation on crust.
	thawed	—	—	Sample gained weight.
2	frozen	—	—	
	thawed	—	—	no deterioration
3	frozen	—	—	
	thawed	—	—	no deterioration

SPECIMEN NO 5B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 31 %

TOTAL WEIGHT 3268 g

FINAL MOISTURE CONTENT 33 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	—	
	thawed	—	—	Sample gained weight. Condensation?
2	frozen	—	—	
	thawed	—	—	
3	frozen	—	—	
	thawed	—	—	no deterioration

SPECIMEN NO 6B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Hercobind

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.54 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 31 %

TOTAL WEIGHT 3527 g

FINAL MOISTURE CONTENT 35 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	2	2	
2	frozen	0	2	slight flaking of crust
	thawed	5	7	at crack
3	frozen	—	—	sample gained weight
	thawed	—	—	

SPECIMEN NO 7B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.09 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3350 g

FINAL MOISTURE CONTENT 29 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	3	3	
2	frozen	0	3	
	thawed	5	8	no deterioration
3	frozen	0	8	
	thawed	4	12	no deterioration

SPECIMEN NO 8B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.09 gal/yd^2

HEIGHT OF CONE 3.0 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3216 g

FINAL MOISTURE CONTENT 29 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	0	0	
2	frozen	0	0	
	thawed	4	4	
3	frozen	0	4	
	thawed	2	6	no deterioration

SPECIMEN NO 9B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.75 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3269 g

FINAL MOISTURE CONTENT 31 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	3	3	
2	frozen	0	3	
	thawed	3	6	
3	frozen	0	6	
	thawed	0	6	no deterioration

SPECIMEN NO 10B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3259 g

FINAL MOISTURE CONTENT 32 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	1	1	
2	frozen	0	1	
	thawed	2	3	condensation on sample
3	frozen	0	3	
	thawed	2	5	no deterioration

SPECIMEN NO 11B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 4.0 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 2961 g

FINAL MOISTURE CONTENT 38 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	—	
	thawed	3	—	
2	frozen	—	—	Sample gained weight.
	thawed	—	—	Condensation on sample.
3	frozen	—	—	
	thawed	—	—	3 cm crack - no peeling

SPECIMEN NO 12B

TEST DATE June 28-July 5, 1985

DUST CONTROL PRODUCT Resinex

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3370 g

FINAL MOISTURE CONTENT 39 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	3	3	
2	frozen	0	3	
	thawed	4	7	
3	frozen	—	—	Sample gained weight.
	thawed	—	—	No deterioration.

SPECIMEN NO 1C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.09 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 33 %

TOTAL WEIGHT 3100 g

FINAL MOISTURE CONTENT 11 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	8	8	
2	frozen	0	8	
	thawed	10	18	
3	frozen	0	18	
	thawed	7	25	no deterioration

SPECIMEN NO 2C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.09 gal/yd^2

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 33 %

TOTAL WEIGHT 3367 g

FINAL MOISTURE CONTENT 12 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	9	9	
2	frozen	0	9	
	thawed	7	16	
3	frozen	0	16	
	thawed	8	24	no deterioration

SPECIMEN NO 3C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3296 g

FINAL MOISTURE CONTENT 10 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	7	7	
2	frozen	0	7	
	thawed	7	14	
3	frozen	0	14	
	thawed	9	23	no deterioration

SPECIMEN NO 4C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20 °C

APPLICATION RATE 0.18 gal/yd²

HEIGHT OF CONE 4.0 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3624 g

FINAL MOISTURE CONTENT 15 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	8	8	
2	frozen	0	8	
	thawed	7	15	
3	frozen	0	15	
	thawed	11	26	no deterioration

SPECIMEN NO 5C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED +4 °C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 3.5 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3404 g

FINAL MOISTURE CONTENT 22 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	3	3	
2	frozen	0	3	
	thawed	4	7	
3	frozen	0	7	
	thawed	4	11	no deterioration

SPECIMEN NO 6C

TEST DATE July 12-19, 1985

DUST CONTROL PRODUCT Dusticide

DILUTION 5:1

TEMPERATURE WHEN PRODUCT APPLIED -20°C

APPLICATION RATE 0.54 gal/yd²

HEIGHT OF CONE 4.0 in

INITIAL MOISTURE CONTENT 32 %

TOTAL WEIGHT 3530 g

FINAL MOISTURE CONTENT 13 %

Wind Test Results

Cycle No	Temperature of Specimen	Cycle Weight Loss (g)	Total Weight Loss (g)	Visual Conditions of Crust
1	frozen	0	0	
	thawed	7	7	
2	frozen	0	7	
	thawed	9	16	
3	frozen	0	16	
	thawed	10	26	no deterioration